

native warm-season grasses
for Missouri stockmen



Missouri stockmen are rediscovering the usefulness of native warm-season grasses in their forage programs. Adding these grasses to pasture systems has resulted in increased gains on yearling cattle and improved performance of cow-calf herds during the summer when cool-season grasses (fescue, bluegrass) stop growing.

Warm-season grasses are not new to Missourians. When Missouri was settled, over 15 million acres of these grasses grew abundantly over the state. Early stockmen were quick to realize that prairie grasses—big bluestem, little bluestem, Indian grass, switchgrass and others—provided useful livestock forage. They described the central Missouri prairies as “covered with sweet, luxuriant grass,” which was “equally good for grazing and haying; grass not surpassed in growing and fattening cattle.” However, without knowledge of native grass management, the prairie grasses soon were weakened by overgrazing and late mowing. Stockmen replaced these warm-season grasses with cool-season grasses.

Yield and quality

Season production of warm-season grasses is comparable to that of cool-season grasses. Production from pure grass stands will average 1.75 to 3.5 tons per acre. Yields of 3.8 tons per acre have been recorded on a pure Indian grass stand at Elsberry, Missouri. Over 70 percent of this tonnage was produced after June 15.

Crude protein levels of native grass stands reach about 15 percent early in the growing season. Protein content declines to 8 percent in late August, a level that is adequate for maintaining cattle body weight.

Grazing studies of yearling steers have shown satisfactory gains in the Midwest. Nebraska tests showed gains of 1.28 pounds per day from a mixture of warm-season grasses, 1.35 pounds per day from pure switchgrass, 1.97 from big bluestem and 1.74 from Indian grass. In other Nebraska tests, the addition of warm-season grasses to a cool-season pasture system provided additional gains in excess of 70 pounds per head per grazing season. Pasture trials at the Seat Demonstration Farm in Worth County, Missouri produced similar results in 1983 in spite of severe drought and heat.

Legumes and native grass

Virgin prairies contain a variety of native legumes which improve the quality of the forage and add nitrogen for increased production by the grasses. Native legume seed costs are high in comparison to domestic legumes so certain domestic legumes may be used with native grasses to improve production and diversity of forage. Korean and Kobe lespedezas are acceptable statewide. Bird's-foot trefoil has been used successfully in north Missouri.

Illinois bundleflower, a native legume, may be planted at ¼ to ½ lb./ac. with the grasses or in the following February or March.

By adding legumes to a native grass stand, you can increase hay production 15-20 percent. Legumes also will boost the protein level of the grasses and extend the period that crude protein is above the 8 percent maintenance level.

Haying

The primary benefits of native grass hayland are ease of maintenance, dependable production, and harvest during a normal lull in farming operations. A stand of native grasses seeded with a legume will produce a consistent two to three tons of hay per acre when harvested in July. Since the hay is harvested after crops have been planted and cool-season grasses have slowed growth, native haylands help to reduce the spring rush of field work.

The quantity and quality of warm-season grass hay depends upon the harvest date. In Missouri, ideal haying dates are June 15-July 1 for switchgrass, July 1-15 for big bluestem, and July 15-30 for Indian grass. Do not mow after August 1. Leave a four- to six-inch stubble when mowing. Regrowth after mowing may be grazed after a killing frost but some protective cover should remain throughout the winter.

Grazing

The addition of a warm-season grass pasture to a cool-season pasture system will improve the efficiency of the forage program. Warm and cool-season grasses are most nutritious while they are vigorously growing. Cool-season grasses such as brome and fescue grow most during the spring and fall. Warm-season grasses (bluestems, Indian grass, switchgrass), grow most in the late spring and summer. By fully utilizing each species of grass during its prime quality, a stockman can keep his herd feeding on high-nutrition forage the entire grazing season. This is called a complimentary forage system. Table 1 shows the best dates for grazing warm- and cool-season grasses. In general, the amount of warm-season pasture should be one-third to one-fourth the total pasture acreage.

An added benefit of the complimentary forage system is that each type of grass has a rest period while livestock are grazing other pastures. During this period, the grasses are able to strengthen their root systems. The benefit of this rest period is a healthy stand of grasses that maintains a higher production level and continues to produce even in years of adverse weather.

Table 1: Guidelines for rotation grazing cool-season and warm-season grass pastures

Livestock class	Pasture type	Jan	Feb	March	April	May	June	July	Aug	Sept	Oct	Nov	Dec
Steer	Cool-season												
	Warm-season (mixed stand)*							1					
	or									2			
	Warm-season (pure stand)**						3						
								4					
Cow-calf	Cool-season												
	Warm-season												

* 1. Intensive grazing season (double-stocking rate)
2. Standard grazing season
**Pure stands of warm season grass: 3. switchgrass
4. big bluestem
5. Indiangrass

Maintenance burning

Maintenance of warm-season grass units in order to sustain high forage yields and desired composition is achieved by burning the plantings periodically. Burns should be conducted when new growth on bluestems is one inch high. This condition varies by weather conditions and region of the state, but usually occurs in early April in south Missouri and early May in north Missouri. Hayland should be burned every three to five years. On pastures of warm-season grass mixtures in which two or more units are available, burn the first unit to be grazed that year. Pastures of a single grass species should be burned every third year.

Adequate safety features for controlled burning can be designed into warm-season grass plantings. Locate warm-season grass plantings adjacent to cool-season grasses, cropfields or other areas that will act as a natural firebreak during prescribed burning. Fire lanes can be constructed in warm-season grass pastures by mowing an 8-16 foot wide strip the year prior to burning before the cattle are removed from the pasture. The cattle will graze the tender new growth on this strip and leave less fuel to deal with the following spring.

Grazing rates

Proper grazing rates are extremely important in achieving good weight gains and maintaining a healthy grass stand. The key to determining proper stocking rates is good judgment and experience. The proper stocking rate has been reached when the grass stubble at frost is at 12 inches tall. Grazing below 12 inches is

allowable if there is enough growing season left after the cattle are removed for the grasses to regrow to 12 inches by frost. Generally 8 inches of stubble by September 1 will regrow to 12 inches by November 1.

General guidelines have been developed to assist the stockman for one or two grazing seasons until he can fine tune his grazing rates. These guidelines are based on the amount of grass produced and the amount livestock require. The amount of forage necessary is listed in animal units (AUs). One AU equals the amount of grass and other forage that one mature cow eats. Since different sizes and kinds of animals eat different amounts, Table 2 lists the number of AUs of forage for various animals. Then it's a matter of simple arithmetic to determine the total AUs of forage necessary for a herd.

Table 3 provides an estimate of the amount of forage available to feed each AU grazing a pasture. Forage production varies considerably from shallow Ozark soils to deep river-bottom soils. Since the amount

Table 2: Forage consumption in Animal Units (AU)

Livestock	Size	AU
Cattle	mature cow	1.00
	cow & calf	1.25
	weaning calf	.50
	yearling (9- 18 mos.)	.70
	mature bull	1.50
Horse	all	1.20
Mule	all	1.20
Sheep	ewe & lamb	.30
	all others	.20

Table 3: Acres per AU according to forage production and months of grazing warm-season grasses.

Acres needed per animal unit							
Grazing period (months)	poor shallow soils	Lbs. of forage per acre					deep productive soils
		2,000	3,000	4,000*	5,000	6,000	
2		1.2	.8	.6	.48	.4	
3		1.8	1.2	.9	.7	.6	
4		2.4	1.6	1.2	.96	.8	
5		3.0	2.0	1.5	1.2	1.0	
*Statewide average							

of time the pasture will be grazed and the amount of forage produced per acre will vary, the stockman still must use good judgment.

Example: Cool-season grasses usually stop growing for about a four-month period during the middle of the grazing season. The statewide average production of warm-season grasses is about 4,000 pounds of forage per acre (see Table 3). According to Table 3, during this four-month period, you will need 1.2 acres of pasture per animal unit (AU) in a warm-season grass pasture that produces 4,000 pounds of forage per acre.

Caution: Livestock will eat more warm season grass than cool-season grass by choice. This sometimes results in overgrazing based on total volume forage production estimates. Be conservative with initial stocking rates.

A stockman should estimate his forage yield based on his soil type and the density of his grass stand, remembering that 4,000 pounds per acre is a statewide average which includes some deep north Missouri soils (producing 6,000 pounds per acre) and some shallow Ozark soils (producing 2,000 pounds per acre). Exact forage production measurement is possible, but requires technical expertise. Stockmen who wish to determine exact forage production figures, or would like assistance in managing their warm-season grasses should contact their Conservation Department or Soil Conservation Service representative for more details.

Caution!

Poor production from warm-season grasses generally is a result of overgrazing, mowing too close to the ground, or mowing too late in the season. Native grasses need leaf surface to continue growing vigorously. Although cool-season grasses may survive repeated overgrazing, such practices on native grasses will quickly destroy the stand. When haying warm-season grasses, never mow shorter than 4 inches, after August 1, or graze after haying!

Other native grass brochures available from the Department of Conservation or Soil Conservation Service:

Native grasses

Establishing native warm-season grasses

Native grasses for wildlife